

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicants: Young-Kyun Kwon, Seung-Hoon Jhi, Keith Bradley, Philip G. Collins,  
Jean-Christophe P. Gabriel, George Grüner, Marvin Cohen, Steven  
Louie, and Alex Zettl  
Assignee: COVALENT MATERIALS, INC.  
Title: Increasing Hydrogen Adsorption Of Nanostructured Storage Materials  
By Modifying  $sp^2$  Covalent Bonds  
Serial No.: 10/020,344 Filing Date: December 11, 2001  
Examiner: Unknown Group Art Unit: Unknown  
Docket No.: M-12324 US

San Francisco, California  
March 19, 2002

COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

INFORMATION DISCLOSURE STATEMENT  
UNDER 37 CFR § 1.97(b)

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Dear Sir:

Pursuant to 37 C.F.R. § 1.56, § 1.97 and § 1.98, the documents listed on the  
accompanying form PTO-1449 are called to the attention of the Examiner for the above patent  
application. Copies of these documents are enclosed.

Citation of these documents shall not be construed as:

1. an admission that the documents are necessarily prior art with respect to the  
instant invention;
2. a representation that a search has been made, other than as described above; or
3. an admission that the information cited herein is, or is considered to be,  
material to patentability as defined in § 1.56(b).

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Respectfully submitted, MAY 14 2002

Gergely T. Zimányi  
Agent for Applicants  
Reg. No. 45,754

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SKJERVEN MORRILL  
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SAN FRANCISCO, CA 94111  
(415) 217-6000  
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U.S. Department of Commerce, Patent and Trademark Office	Atty Docket No.	Serial No.
	M-12324 US	10/020,344
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		Applicants: Young-Kyun Kwon et al.
(Use several sheets if necessary)		Filing Date: December 11, 2001
		Group: Unknown

## U.S. Patent Documents

*Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
AA	4,960,450	10/02/90	Schwarz et al.	62	18	
AB	5,653,951	08/05/97	Rodriguez et al.	423	439	
AC	6,159,538	12/12/00	Rodriguez et al.	427	213.31	
AD	6,231,980 B1	05/15/01	Cohen et al.	428	402	

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## Foreign Patent Documents

							Translation	
	Document	Date	Country	Class	Subclass		Yes	No
AE								

## OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

AF	Chambers et al., "Hydrogen Storage in Graphite Nanofibers," The Journal of Physical Chemistry B., Vol. 102, No. 22, May 28, 1998, pp. 4253-4256.
AG	Dillon et al., "Storage of hydrogen in single-walled carbon nanotubes," Letters to Nature, Vol. 386, March 27, 1997, pp. 377-379.
AH	Poirier et al., "Hydrogen adsorption in carbon nanostructures," International Journal of Hydrogen Energy Vol. 26, 2001, pp. 831-835.
AI	Han et al., "Pyrolytically grown arrays of highly aligned B <sub>x</sub> C <sub>y</sub> N <sub>z</sub> nanotubes," Applied Physics Letters, Vol. 78, No: 18, April 30, 2001, pp. 2769-2771.
AJ	Cumings et al., "Mass-production of boron nitride double-wall nanotubes and nanococoons," Chemical Physics Letters Vol. 316, 2000, pp. 211-216.
AK	Weng-Sieh et al., "Synthesis of B <sub>x</sub> C <sub>y</sub> N <sub>z</sub> nanotubules," Physical Review B, Vol. 51, No. 16, April 15, 1995, pp. 229-232.
AL	Wu et al., "Superconducting MgB <sub>2</sub> Nanowires," Advanced Materials, Vol. 13, No. 19, October 2, 2001, pp. 1487-1489.
AM	Eckerlin et al., "Zur Kenntnis des systems Be <sub>3</sub> N <sub>2</sub> --Si <sub>3</sub> N <sub>4</sub> : Die Struktur einer neuen Modifikation von Be <sub>3</sub> N <sub>2</sub> ," Zeitschrift für anorganische und allgemeine Chemie, Vol. 304, 1960, pp. 218-229.
AN	Felner, I., "Absence of superconductivity in BeB <sub>2</sub> ," Physica C, Vol. 353, 2001, pp. 11-13.

Examiner

Date Considered

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.

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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)			
BA	La Placa et al., "Boron Clusters ( $B_n$ , $n=2-52$ ) produced by laser ablation of hexagonal boron nitride," Chemical Physics Letters, Vol. 190, No. 3,4, March 6, 1992, pp. 163-167.		
BB	Tracy Hall et al., "Group IV Analogs and High Pressure, High Temperature Synthesis of $B_2O_3$ ," Inorganic Chemistry, Vol. 4, No. 8, August 1965, pp. 1213-1216.		
BC	Ruthven, Douglas M., "Adsorption, Fundamentals," Kirk-Othmer Encyclopedia of Chemical Technology, April 16, 2001 (Online Posting Date), 34 pp.		
BD	Dillon et al., "A Simple and Complete Purification of Single-Walled Carbon Nanotube Materials," Advanced Materials, Vol. 11, No. 16, 1999, pp. 1354-1358.		
BE	Duesberg et al., "Chromatographic size separation of single-wall carbon nanotubes," Applied Physics A, Vol. 67, 1998, pp. 117-119.		
BF	Shelimov et al., "Purification of single-wall carbon nanotubes by ultrasonically assisted filtration," Chemical Physics Letters, Vol. 282, 1998, pp.429-434.		
BG	Jeong et al., "A new purification method of single-wall carbon nanotubes using $H_2S$ and $O_2$ mixture gas," Chemical Physics Letters, Vol. 344, 2001, pp. 18-22.		
BH	Park et al., "High yield purification of multiwalled carbon nanotubes by selective oxidation during thermal annealing," Carbon, Vol. 39, 2001, pp. 655-661.		
BI	Ashraf Imam et al., "Hydrogen Storage on Carbon-Based Nanomaterials," NANOTUBE 2001, 2 <sup>nd</sup> International Workshop on the Science and Application of Nanotubes, 2001, 30 pp.		
BJ	Ralph T. Yang, "Hydrogen Storage By Alkali-doped Carbon Nanotubes-revisited", Carbon Vol. 38 (2000), pp. 623-626.		
BK	P. Chen et al., "High $H_2$ Uptake By Alkali-doped Carbon Nanotubes Under Ambient Pressure And Moderate Temperatures", Science Vol 285 (July 2, 1999), pp. 91-93.		
BL	K. Murata et al., "Pore Structure Of Single-wall Carbon Nanohorn Aggregates", Chemical Physics Letters Vol. 331, (November 24, 2000), pp. 14-20.		
BM	Y. Ye et al., "Hydrogen Adsorption And Phase Transitions In Fullerite", Applied Physics Letters Volume 77, Number 14, (October 2, 2000), pp. 2171-2173.		
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